Algebra 2/Trig1 Name Key

Review: Quad Eqns, Solving Polynomials & Radicals Block _____ Date _____

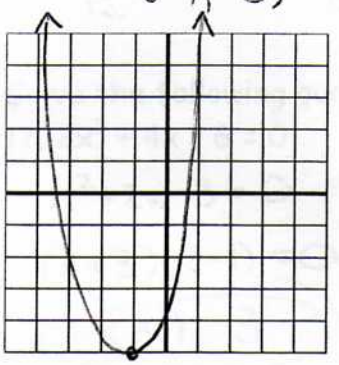
Graph the following quadratics equations written in standard form.

1. $y = 2x^2 + 4x - 3$

$\frac{-4}{2(2)} = \frac{-4}{4} = -1$

$2(-1)^2 + 4(-1) - 3$

Vertex: $(-1, -5)$



2. $y = -x^2 + 6x$

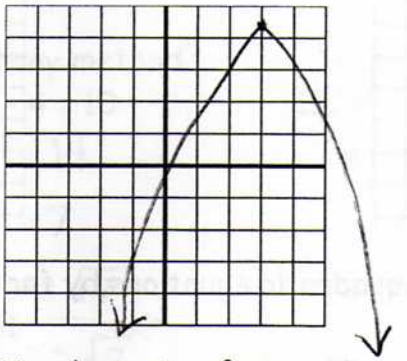
$\frac{-6}{2(-1)} = 3$

$-(3)^2 + 6(3)$

$-9 + 18$

9

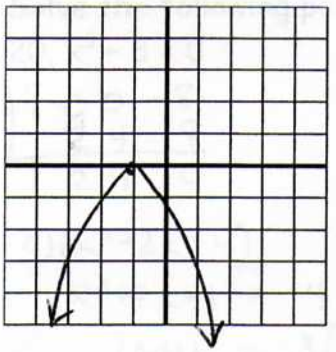
Vertex: $(3, 9)$



Graph the following quadratics equations written in vertex form.

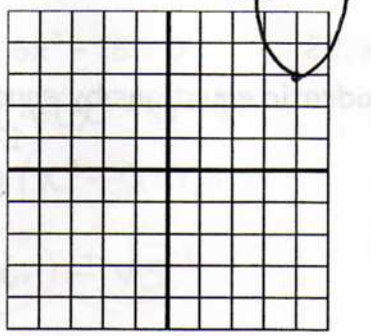
3. $y = -3(x + 1)^2$

Vertex: $(-1, 0)$



4. $y = (x - 4)^2 + 3$

Vertex: $(4, 3)$



Graph the following quadratics equations written in intercept form.

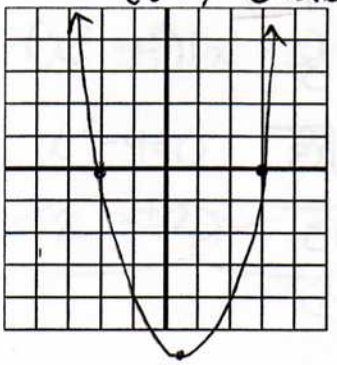
5. $y = (x - 3)(x + 2)$

x-intercept(s): 3 and -2

Vertex: $(.5, -6.25)$ $\frac{3+-2}{2} = \frac{1}{2}$

$(\frac{1}{2} - 3)(\frac{1}{2} + 2)$

-6.25



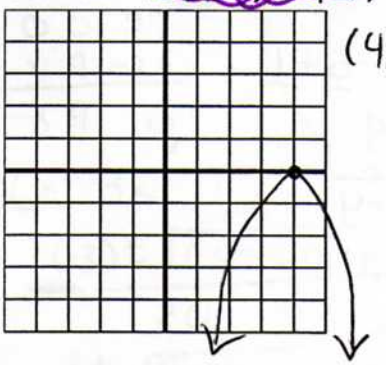
6. $y = -(x - 4)(x - 4)$

$(x-4)$

x-intercept(s): 4, 4

Vertex: $(4, 0)$ $\frac{4+4}{2} = \frac{8}{2} = 4$

$(4, 0)$

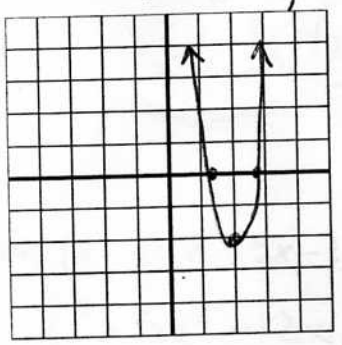


Graph the following quadratics equations using your graphing calculator.

7. $y = 3x^2 - 12x + 10$

Vertex: $(2, -2)$

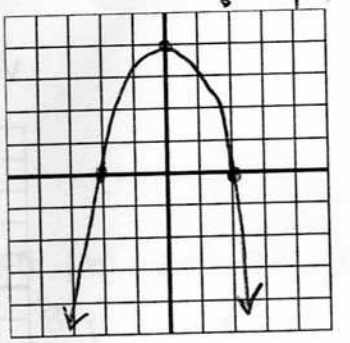
x-intercepts: $1.18, 2.82$



8. $y = -x^2 + 4$

Vertex: $(0, 4)$

x-intercepts: -2, and 2



Solve the following quadratic equations by factoring.

9. $3x^2 - 5x - 12 = 0$

$(3x + 4)(x - 3) = 0$

$x = -\frac{4}{3}$ $\quad x = 3$

10. $x^2 - 6x + 5 = 0$

$(x-5)(x-1) = 0$

$x = 5, 1$

Solve the following quadratic equations by square rooting both sides.

11. $(x - 3)^2 - 4 = 0$

$(x-3)^2 = 4$

$x - 3 = \pm\sqrt{4}$

$x = 3 \pm 2$

$x = 5, 1$

12. $x^2 + 15 = 12$

$x^2 = -3$

$x = \pm\sqrt{-3}$

$x = \pm i\sqrt{3}$

Solve the following quadratic equations by completing the square.

13. $2x^2 + 4x + 10 = 0$

$x^2 + 2x + 5 = 0$

$x^2 + 2x \underline{+1} = -\underline{5} \underline{+1}$

$(x+1)^2 = -4$

$x + 1 = \pm\sqrt{-4}$

$x + 1 = \pm 2i$

$x = -1 \pm 2i$

14. $x^2 + 6x - 4 = 0$

$x^2 + 6x \underline{+9} = 4 \underline{+9}$

$(x+3)^2 = 13$

$x + 3 = \pm\sqrt{13}$

$x = -3 \pm \sqrt{13}$

Solve the following quadratic equations using the quadratic formula. $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

15. $6x^2 - 13x - 5 = 0$

$$\frac{-(-13) \pm \sqrt{(-13)^2 - 4(6)(-5)}}{2(6)}$$

$$\frac{13 \pm \sqrt{169 + 120}}{12}$$

$$\frac{13 \pm \sqrt{289}}{12} \qquad \frac{13 \pm 17}{12}$$

$\frac{-4}{12} = \frac{-1}{3} = -.33$

$\frac{5}{2}$ or 2.5

$x = \frac{5}{2}, -\frac{1}{3}$

16. $4x^2 + x + 5 = 3x^2 - 2x$

$x^2 + 3x + 5 = 0$

$$\frac{-3 \pm \sqrt{(3)^2 - 4(1)(5)}}{2(1)}$$

$$\frac{-3 \pm \sqrt{9 - 20}}{2}$$

$$\frac{-3 \pm i\sqrt{11}}{2}$$

Solve the following quadratic equations using any method.

17. $2x^2 + 4x - 6 = 0$

$x^2 + 2x - 3 = 0$

$(x+3)(x-1) = 0$

$x = 1, -3$

18. $2(x-3)^2 - 4 = 10$

$2(x-3)^2 = 14$

$(x-3)^2 = 7$

$x - 3 = \pm\sqrt{7}$

$x = 3 \pm \sqrt{7}$

19. $x^2 - 8x + 6 = 0$

$x^2 - 8x + 16 = -6 + 16$

$(x-4)^2 = 10$

$x - 4 = \pm\sqrt{10}$

$x = 4 \pm \sqrt{10}$

Solve the following polynomial equations.

20. $x^3 - 8 = 0$

2	1	0	-8
		2	4
	1	2	4
			0

$(x-2)(x^2+2x+4)$

$x^2 + 2x + 1 = -4 + 1$

$(x+1)^2 = -3$

$x + 1 = \pm\sqrt{-3}$

$x = 2 \qquad x = -1 \pm i\sqrt{3}$

21. $x^3 - 3x + 6x^2 - 18 = 0$

$x(x^2-3) + 6(x^2-3) = 0$

$(x+6)(x^2-3) = 0$

$x = -6, \pm\sqrt{3}$

22. $x^4 - 6x^2 = 0$

$x^2(x^2-6) = 0$

$x = 0$ (2 times) $\qquad x = \pm\sqrt{6}$

23. $x^4 - x^2 - 12 = 0$

$(x^2-4)(x^2+3) = 0$

$x^2 - 4 = 0 \qquad x^2 + 3 = 0$

$x = \pm 2 \qquad x^2 = -3$

$x = \pm i\sqrt{3}$

24. $x^3 + 27 = 0$

-3	1	0	0	27
		-3	9	-27
	1	-3	9	0

$(x+3)(x^2-3x+9)$

$x = -3$

$$\frac{-(-3) \pm \sqrt{(-3)^2 - 4(1)(9)}}{2(1)}$$

$$\frac{3 \pm \sqrt{9 - 36}}{2} \qquad \frac{3 \pm \sqrt{-27}}{2}$$

$$\frac{3 \pm 3i\sqrt{3}}{2}$$

25. $x^3 + 5x^2 - 4x - 20 = 0$

$x^2(x+5) - 4(x+5) = 0$

$(x+5)(x^2-4) = 0$

$x + 5 = 0 \qquad x^2 - 4 = 0$

$x = -5, \pm 2$

Solve the following radical equations. Be sure to check your answers.

26. $\sqrt{x} = 8$

$x = 64$

check ✓

27. $\sqrt[4]{x} = 3$

$x = 81$

check ✓

28. $\sqrt[3]{x+2} = 3$

$x + 2 = 27$

$x = 25$

check ✓

29. $x^{1/5} = -3$

$x = (-3)^5$

$x = -243$

check ✓

30. $x^{3/2} = 8$

$x = 8^{2/3}$

$x = 4$

check ✓

31. $x^{2/3} = 4$

$x = 4^{3/2}$

$x = 8$

check ✓

32. $\sqrt{2x+3} = \sqrt{4x-7}$

$2x + 3 = 4x - 7$

$10 = 2x$

$5 = x$

check ✓

33. $\sqrt{3x+1} + 5 = 3$

$\sqrt{3x+1} = -2$

ϕ

$3x + 1 = 4$

$3x = 3$

$x = 1$

check:

$\sqrt{4} + 5 = 3$

$2 + 5 = 3$

$7 \neq 3$

34. $(x+2)^{2/3} = 4$

$x + 2 = 4^{(3/2)}$

$x + 2 = 8$

$x = 6$

check ✓

Review from Previous Chapters

35. Solve the equation: $\frac{3}{2}(2x+7) = 3$

$\frac{2}{3}\left(\frac{3}{2}(2x+7)\right) = 3 \cdot \frac{2}{3}$

$(2x+7) = 2$

$2x = -5$

$x = \frac{-5}{2}$

36. Solve & graph the equation: $|x-2| - 8 < 4$

$|x-2| < 12$

$x - 2 < 12$

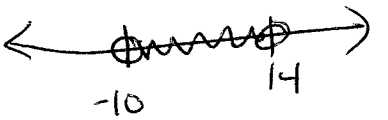
$x < 14$

$-(x-2) < 12$

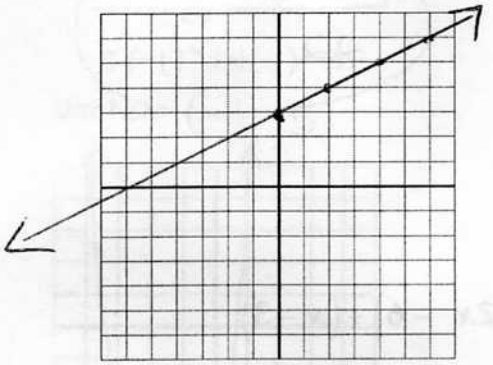
$-x + 2 < 12$

$-x < 10$

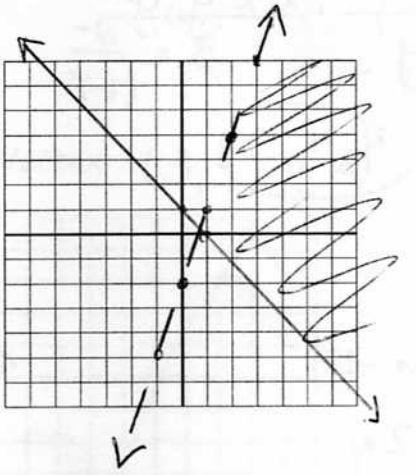
$x > -10$



37. Graph the equation: $y = \frac{1}{2}x + 3$



38. Graph the inequality: $\begin{cases} y \geq -x + 1 \\ y < 3x - 2 \end{cases}$



39. Write the equation of the line that passes through (2,5),(-1,-1)

$m = \frac{-1-5}{-1-2} = \frac{-6}{-3} = 2$

$y = mx + b$

$5 = 2(2) + b$

$1 = b$

$y = 2x + 1$

40. Solve the system of equations: $6x - 8y = 10$, $4(2x + 2y = 1)$

$2(1) + 2y = 1$

$2 + 2y = 1$

$2y = -1$

$y = -\frac{1}{2}$

$6x - 8y = 10$

$8x + 8y = 4$

$14x = 14$

$x = 1$

$(1, -\frac{1}{2})$

41. Make a scatter plot of the data and approximate a best-fit line.

x	0	1	5	6	7	9	10	12	15
y	5	5	10	13	17	22	26	33	37

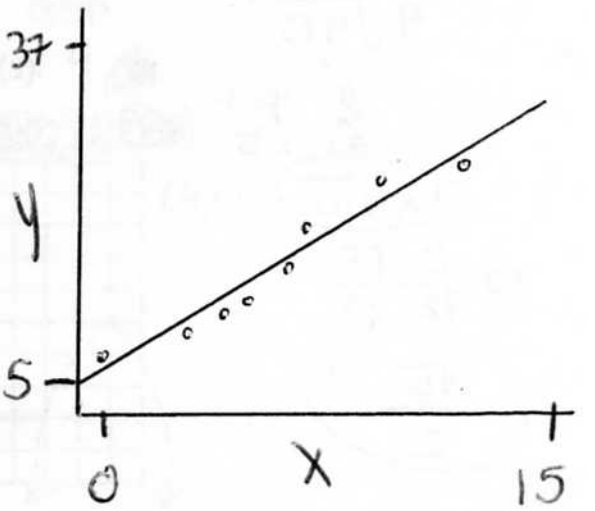
a) Sketch of the scatterplot and line of best fit

b) Equation of Best Fit $y = 2.337x + 1.788$

c) Correlation Value and Description (stong/weak, positive/negative)

$r = .9797$

strong positive



42. Simplify: $\frac{3x^2y^{-1}}{2x^0} \cdot \frac{8x^2y^2}{3y^{-3}}$

$\frac{3x^2}{2y} \cdot \frac{4 \cancel{8} x^2y^2y^3}{\cancel{3}}$

$4x^4y^4$

43. $\frac{(3-\sqrt{2})}{5+\sqrt{3}} \cdot \frac{(5-\sqrt{3})}{5-\sqrt{3}} = \frac{15-3\sqrt{3}-5\sqrt{2}+\sqrt{6}}{25-5\sqrt{3}+5\sqrt{3}-3}$

$15-3\sqrt{3}-5\sqrt{2}+\sqrt{6}$

22

44. $(x-2)(x^2+5x-12)$

x^3+5x^2-12x

$-2x^2-10x+24$

$x^3+3x^2-22x+24$

45. $(x^4-3x^3+2x-6) \div (x-3)$

3	1	-3	0	2	-6
		3	0	0	6
	1	0	0	2	0

$(x-3)(x^3+2)$

x^3+2

46. Evaluate: $\sqrt[5]{27} \cdot \sqrt[5]{18}$

$5\sqrt{27 \cdot 18}$

$3\ 9\ 3\ 6$

$3\ 3\ \ 3\ 2$

$3\sqrt[5]{2}$

47. Simplify: $\sqrt[5]{6x^6y^7z^8}$

$xyz\sqrt[5]{6xy^2z^3}$

48. $\sqrt{3} \cdot 4\sqrt{30}$

$4\sqrt{90}$

$9\ \ 10$

$3\ 3\ \ 2\ 5$

$12\sqrt{10}$

49. $\sqrt{\frac{2}{25}}$ $\frac{\sqrt{2}}{5}$

50. $\sqrt{\frac{3}{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$

$\frac{\sqrt{6}}{2}$

51. $5\sqrt{2}+6\sqrt{2}$

$11\sqrt{2}$